

A vibrant underwater scene featuring a variety of coral reefs in shades of orange, pink, and yellow. Several colorful fish, including yellow tangs, a striped surgeonfish, and a blue tang, are swimming near the coral. In the upper right, a school of silver fish swims towards the surface. Sunlight rays filter down from the top of the frame, creating a bright, blue atmosphere.

Family Unit Study: *The Ocean*

SARAH NOFTLE & MALLORY FOSTER

TEACHER AND READING SPECIALIST



Copyright © 2022 by Sarah Noftle

All rights reserved.

No part of this publication may be reproduced, distributed, or transmitted in any form or by any means, including photocopying or other electronic or mechanical methods, without the prior written permission from the author. For permission requests, write to the author at: sarah@howweelearn.com.

Design and Layout by Mallory Foster: www.malloryfoster.com

Visit the author's website at: www.HowWeeLearn.com



FAMILY UNIT STUDY: THE OCEAN

Table of Contents

INTRODUCTION

Welcome Home!.....	4
Book List.....	6

TOPICS

The Five Oceans	8
Waves.....	10
The Sunlight Zone	12
The Twilight Zone.....	14
The Deep Ocean.....	16
All About Dolphins.....	18
All About Jellyfish.....	20
Creatures of the Deep.....	22
Coral Reefs.....	24
Marine Biologists.....	26

PRINTABLES

Simplified Playdough World Map	28
The Sunlight Zone Animals.....	29
The Twilight Zone Animals	30
The Deep Ocean Animals.....	30
2D and 3D Shapes	31
Dolphin Silhouettes.....	32
<i>Turritopsis dohrnii</i> Life Cycle	33
Coral Playdough Mats.....	34-35
My Unit Study Notes.....	36



FAMILY UNIT STUDIES

Welcome Home!

Thank you so much for choosing a How Wee Learn Family Unit Study. This unit study has been created with care by me, a homeschooling mom and former teacher. These unit studies have worked so beautifully with my own family, I knew they must be shared. My time in the classroom, certification as a Reading Specialist, and 18 years as a mom gives me a unique perspective on what children truly “need to know.”

What is a unit study?

A unit study focuses on critical thinking and problem solving, allowing children to dive deep into fascinating topics and engage in meaningful learning.

When a child is engaged in what he or she is learning, that learning sticks. And when a child is engaged *and fascinated* in what he or she is learning, learning is amazingly fun for the whole family! Say goodbye to those power struggles.

Each unit study is broken down into ten topics with manageable, bite-sized amounts of incredible information. Each of these ten topics includes a hands-on activity, a math or literacy enrichment activity, a curated YouTube video, a book suggestion, an interesting fact, and a discussion question.

What are the components of a unit study?

HANDS-ON ACTIVITY

Each of the ten topics includes a hands-on activity that brings the information shared and discussed to life! This allows children to really engage in and solidify their learning. The hands-on activities use items you likely have already. If you do not have an item, think creatively about what you do have and adapt. No buttons? I bet beads could work. No pipe cleaners? Maybe you have some yarn!

MATH ENRICHMENT WORD PROBLEM

Each unit study includes five math word problems modified to three levels so they are fitting for the whole family. They cover five math strands: Number Sense, Geometry, Measurement, Patterning, and Data Management/Probability. The word problem introduces your child to each of these areas with

the belief of quality over quantity. This is not a full math curriculum, of course, but an enrichment opportunity and a chance to be exposed to some real world math.

As you go through a question, consider how you might change it slightly to ask a follow-up question. Perhaps you could ask, “What would happen if there were 6 birds instead of 5?” Or you might get out some manipulatives and help your child dive into deeper learning about the geometry topic introduced.

LITERACY ENRICHMENT ACTIVITY

When a child is learning about a fascinating topic, there are so many natural opportunities to tie in literacy development. Reading, researching, recording information, labeling, and note taking will all happen naturally.

On top of this, each unit study includes five literacy enrichment activities modified to three levels so they are fitting for the whole family. Creating poems, public speaking, practicing letter formation, and literacy scavenger hunts are all fun ways literacy learning is brought to life with these unit studies.

CURATED YOUTUBE VIDEO

Each of the ten topics includes a carefully curated YouTube video. Dive into some fun and easy learning with experts in the field, entertaining stories, and inspiring tales, all selected to highlight key learning concepts. Enjoy some time snuggled on the couch, learning with popcorn and a movie!

BOOK SUGGESTION

The book suggestions for each topic are just that—suggestions. Any books at all on the unit study



theme are strongly encouraged. Immersing our children in a literacy-rich environment, and offering plenty of time to dive into research, pictures, and stories is key for child-led learning.

INTERESTING FACT

Did you know that elephants suck their trunks much like babies suck their thumbs? Or that a human has the same number of neck bones as a giraffe? Interesting facts are a wonderful way to spark a child's interest and imagination, which is why every topic includes an interesting fact.

DISCUSSION QUESTION

Asking the right questions and having meaningful discussions is a wonderful way to meet your child at his or her current level of understanding and to help your child grow his or her learning and thinking about topics. So much can be learned through one meaningful discussion!

How do I use a unit study?

These unit studies are completely flexible and can be used however you wish. For those who would like a few suggestions, I will outline two possible ways you might choose to use these unit studies.

OPTION 1: FOCUSED UNIT STUDY

Your family might choose to focus on one unit study over a two-day period.

Day 1	<ul style="list-style-type: none"> Introduce the topic with the curated YouTube video Have an amazing discussion using the discussion question as a prompt Research more about the topic with the suggested book or a book of your choice Read the interesting fact together
Day 2	<ul style="list-style-type: none"> Dive into the hands-on activity for some deep learning Complete the math or literacy enrichment question
Day 3+	<ul style="list-style-type: none"> Core skill work in reading, writing, and math at your child's individual level Family outings Extracurricular activities Start another topic!

OPTION 2: BLENDED UNIT STUDY

Alternatively, your family might choose to blend the unit study with your core skill learning over a three day period.

Day 1	<p>Morning:</p> <ul style="list-style-type: none"> Core skill work in reading, writing, and math at your child's individual level <p>Afternoon:</p> <ul style="list-style-type: none"> Introduce the topic with the curated YouTube video Have an amazing discussion using the discussion question as a prompt
Day 2	<p>Morning:</p> <ul style="list-style-type: none"> Core skill work in reading, writing, and math at your child's individual level <p>Afternoon:</p> <ul style="list-style-type: none"> Research more about the topic with the suggested book or a book of your choice Read the interesting fact together Complete the math or literacy enrichment question
Day 3	<p>Morning:</p> <ul style="list-style-type: none"> Core skill work in reading, writing, and math at your child's individual level <p>Afternoon:</p> <ul style="list-style-type: none"> Dive into the hands-on activity for some deep learning
Day 4+	<ul style="list-style-type: none"> Core skill work in reading, writing, and math at your child's individual level Family outings Extracurricular activities Start another topic!

There is no right or wrong way to dive into this unit study. When learning is this exciting, you simply cannot go wrong!

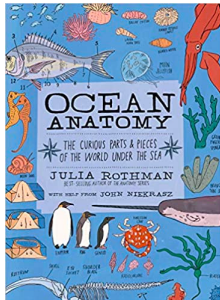
I hope you and your family love this unit study! If you have any questions at all, wish to purchase more unit studies, or if I can be of assistance, please visit www.howweelearn.com/family-homeschooling-unit-studies or email me at sarah@howweelearn.com.

xo
Sarah



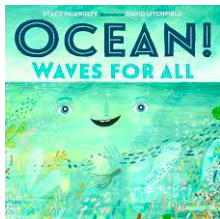
UNIT STUDY: THE OCEAN

Book List



Ocean Anatomy: The Curious Parts & Pieces of the World under the Sea
Julia Rothman

Follow Rothman's inquisitive mind and engaging artwork along shorelines, across the open ocean, and below the waves to explore the hows and whys of the watery universe, from how the world's oceans formed to why the sea is salty.



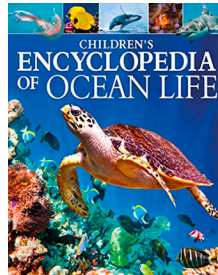
Ocean! Waves for All
Stacy McAnulty

From writer Stacy McAnulty and illustrator David Litchfield, *Ocean! Waves for All* is a light-hearted nonfiction picture book about the formation and history of the ocean, told from the perspective of the ocean itself.



Ocean!: Our Watery World as You've Never Seen it Before
DK

Dive into our planet's largest and least explored world in this stunning encyclopedia of everything ocean—including whales, waves, wrecks, wind farms, and more!



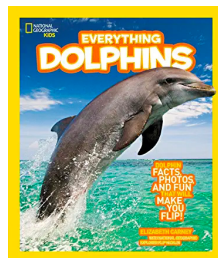
Children's Encyclopedia of Ocean Life
Claudia Martin

Full of fascinating facts and stunning sea life photography, this book covers everything from the ocean shores to deep sea creatures.



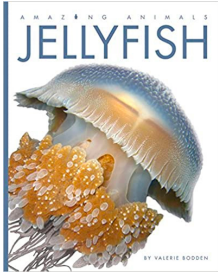
Strange Sea Creatures
Erich Hoyt

The book organizes the creatures into three parts based on where they live in the ocean. Informative captions accompany the 90 gorgeous photographs of otherworldly creatures.



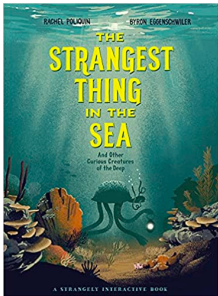
National Geographic Kids Everything Dolphins: Dolphin Facts, Photos, and Fun that Will Make You Flip
Elizabeth Carney

Everything Dolphins explores the world of these extraordinary creatures to help kids learn all about the characteristics that define dolphins, their daily lives, different species, conservation efforts, and much more.



Amazing Animals: Jellyfish
Valerie Bodden

A basic exploration of the appearance, behavior, and habitat of jellyfish, the bell-shaped, oceanic invertebrates. Also included is a story from folklore explaining why jellyfish have squishy bodies.



The Strangest Thing in the Sea: And Other Curious Creatures of the Deep
Rachel Poliquin

An intriguing look at some very strange creatures in the sea—but which is the strangest? A feathery tutu dancing through the water? A tiptoeing rock wearing a wig? A mountain of skulls on the ocean floor? Not everything is quite as it seems in this fascinating exploration of 12 bizarre and little-known sea animals.



Coral Reefs: A Journey Through an Aquatic World Full of Wonder
Jason Chin

Coral Reefs by Jason Chin plunges readers into the ocean with incredible facts about fish, coral reefs and marine life. Readers will experience the ocean like they never have before in this stunning picture book full of breathtaking illustrations.



Secrets of the Sea: The Story of Jeanne Power, Revolutionary Marine Scientist
Evan Griffith

The curiosity, drive, and perseverance of the nineteenth-century woman scientist who pioneered the use of aquariums to study ocean life are celebrated in this gorgeous, empowering picture book.



TOPIC 1

The Five Oceans

Over 70% of the earth's surface is covered with water. While there is only one global ocean, we divide it into five regions: the Pacific Ocean, the Atlantic Ocean, the Indian Ocean, the Arctic Ocean, and the Southern Ocean. Let's explore...

Spark Curiosity



Did you know? About 80% of all oceans in the world are unexplored. There's still a lot of work to do for ocean exploration!



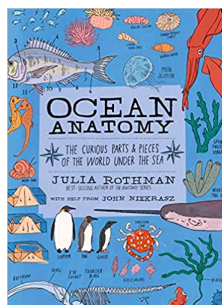
I wonder why ocean water is salty?

Resource Suggestions



Oceans of the World for Kids | Learn all about the 5 Oceans of the Earth
Learn Bright

Learn all about the five oceans of the world in this video designed for kids and elementary students. We walk through the geographic locations for each ocean and share some unique facts about each area.



Ocean Anatomy: The Curious Parts & Pieces of the World under the Sea
Julia Rothman

Follow Rothman's inquisitive mind and engaging artwork along shorelines, across the open ocean, and below the waves to explore the hows and whys of the watery universe, from how the world's oceans formed to why the sea is salty.

HANDS-ON ACTIVITY

- "Map of the Oceans" on page 9

Math Enrichment Word Problem

We know that there are 5 oceans, though they are all connected.

- ★ If there were 3 Earths, side by side, how many oceans would there be?
- ★★ If each of the 5 oceans were split up into 2 parts, how many oceans would there be in total?
- ★★★ If each of the 5 oceans were split up into 6 parts, how many oceans would there be in total?



HANDS-ON ACTIVITY

Map of the Oceans

Types of Learning: Research, Mapping, Following Directions, Labelling

WHAT'S HAPPENING?

While there is only one global ocean, we divide it into five regions:

The Pacific Ocean is the largest ocean, covering more than 30% of the Earth's surface. It is located between the Americas, Asia, and Australia.

The Atlantic Ocean is the second-largest and saltiest ocean in the world. It is located between the Americas, Europe, and Africa.

The Indian Ocean is the third largest ocean, covering 20% of the Earth's surface. It is located between Africa and Australia.

The Arctic Ocean is the smallest and shallowest of all five oceans, centered around the North Pole. It is also the coldest and least salty ocean.

The Southern Ocean is the newest ocean recognized by the International Hydrographic Organization. It borders Antarctica in its entirety. It's an extreme environment and is the least understood of the five oceans. This is because it is unexplored, far from populated areas, and has a severe climate.

Adapted from Earth How.

[Check it out here for more interesting facts.](#)

Materials

- Playdough
- Water
- Cookie sheet

Directions



"Simplified Playdough World Map" on page 28

Today, we are going to make a simplified map using playdough to see how the oceans are all connected.

1. Begin by whipping up a batch of playdough (my easy, no-cook recipe is below).
2. Use the Simplified Playdough World Map printable as a reference, and roughly form the seven continents out of playdough, nice and thick. Press them onto the cookie sheet.
3. Slowly pour water on the cookie sheet, observing how it wraps around the seven continents and forms the five oceans. Can you identify the five oceans?

Playdough Recipe

This is the best playdough recipe, as even very little ones can help in almost the whole recipe. PLUS, you can't mess it up! If it is too sticky—add more flour; too clumpy—add more boiled water.

1. Mix **1 ½ cups flour**, **½ cup salt**, and **2 tsp cream of tartar** in a bowl. The order of ingredients doesn't matter—just pop it all in and stir!
2. Add in **1 cup boiling water**, **2 tbsp oil** and stir. You can add **food colouring** directly to the boiling water if you prefer for nice, easy colour mixing. Or if you want different colours, you can add the food colouring at the end into divided batches.
3. Knead a few times, and it will become perfectly smooth. You can mix in some **essential oils** if you have any, or **vanilla**, or **cinnamon**.



TOPIC 2

Waves

The water in the ocean is constantly moving. Under the surface, ocean water moves in giant currents. On the surface, we can see water moving in waves. Waves are formed by wind, volcano eruptions, earthquakes, and even distant storms. Let's explore...

Spark Curiosity



Did you know? Water doesn't actually travel with the wave, it only moves up and down as the energy of the wave passes through.



I wonder if the currents can move water through all five of the oceans?

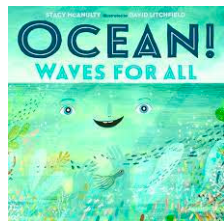
Resource Suggestions



How do Ocean Waves Work?

Concerning Reality

Everyone reading this has probably spent some time at the ocean at some point in their life. The sandy beaches, the peace of the ocean, the crashing waves... but what even are ocean waves, and how do they work?



Ocean! Waves for All

Stacy McAnulty

From writer Stacy McAnulty and illustrator David Litchfield, *Ocean! Waves for All* is a light-hearted nonfiction picture book about the formation and history of the ocean, told from the perspective of the ocean itself.

HANDS-ON ACTIVITY

- "Wave Art" on page 11

Literacy Enrichment Activity

Draw a line of waves across a piece of paper in pencil.

- ★ Go over this line of waves, writing out letters of your name or ocean words in pen. Once the ink is dry, erase your pencil line and you will be left with a wave of words!
- ☆☆ Go over this line of waves, writing out some interesting ocean words you have learned or read about in pen. Once the ink is dry, erase your pencil line and you will be left with a wave of words!
- ☆☆☆ Go over this line of waves, writing out some interesting facts you have learned about waves and oceans. Once the ink is dry, erase your pencil line and you will be left with a wave of words!



HANDS-ON ACTIVITY

Wave Art

Types of Learning: Colour Mixing, Creativity, Breath Control, Observation

WHAT'S HAPPENING?

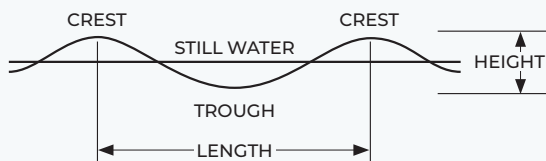
Wind is the most common cause of waves. As the wind blows across the surface of the water, waves form. These waves can be less than 2.5 cm (1 inch) high, to as much as 18 meters (60 feet) tall!

Waves formed by underwater earthquakes, landslides, or volcanic eruptions are known as **tsunamis**. Near the coast, tsunamis may become very large and cause destruction, but in the deep open sea, they cannot be detected by the eye.

The gravitational pull of the sun and moon on the earth also causes waves. These waves are called **tides** or **tidal waves**.

The highest part, or top, of a wave is called the **crest**, or **peak**; and the lowest part, or hollow, is called the **trough**.

The distance between two crests is the length of a wave, and the distance from the crest to the trough is the height of the wave.



Adapted from Britannica Kids.

[Check it out here for more interesting facts.](#)

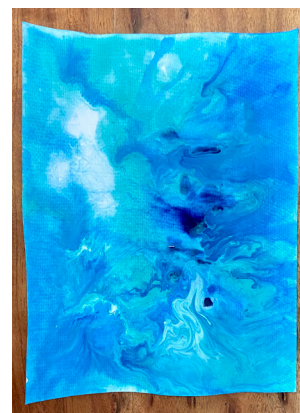
Materials

- Shades of blue and white paint
- Bowl and spoon for mixing, optional
- Paper
- Water, optional
- Straw

Directions

Waves in the ocean are caused by wind blowing over the surface of the water. We can see the impact wind has on wet surfaces with the simple art technique of straw blowing.

1. Get some blue and white paint. Washable tempera paint is great, or acrylic will work too. You might need to add a little bit of water to make your paint really move when it is blown.
2. Take some time to mix a few different shades of blue if you like, adding some colour mixing into this activity.
3. Drop some paint onto a piece of paper and blow the paint gently with a straw, observing what happens.
4. Repeat this again and again, creating a beautiful work of art.





TOPIC 3

The Sunlight Zone

The Sunlight Zone is the surface layer of the ocean that extends down 200 meters. Since this layer is lit by the sun, it is warm and supports a wide variety of plant and animal life. Let's explore...

Spark Curiosity

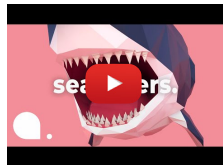


Did you know? Phytoplankton produce as much oxygen as all the plants on land put together—possibly even more!



I wonder where seashells come from?

Resource Suggestions



The Five Layers of the Ocean
Knowva Academy

In order to better study the ocean, scientists have divided it into five different layers.



Ocean!: Our Watery World as You've Never Seen it Before
DK

Dive into our planet's largest and least explored world in this stunning encyclopedia of everything ocean—including whales, waves, wrecks, wind farms, and more!

HANDS-ON ACTIVITY

- "My Ocean Diorama, Part 1" on page 13

Math Enrichment Word Problem

On average, the Sunlight Zone of the ocean reaches down 200 meters, or 650 feet, though it is much shallower in some areas.

- ★ If one part of the Sunlight Zone was 10 feet, and a second part was 25 feet, how much deeper was the second part?
- ★★ If the shallowest part of the Sunlight Zone was only 5 feet deep and the deepest part was 650 feet deep, how much deeper is the deepest part than the shallowest?
- ★★★ If you were measuring the Sunlight Zone with a tape measure that was 10 feet long, how many tape measures would you need to reach the bottom of the Sunlight Zone?



HANDS-ON ACTIVITY

My Ocean Diorama, Part 1

Types of Learning: Scissor Skills, Research, Creativity, Imaginative Play

WHAT'S HAPPENING?

The ocean is an incredibly deep and enormous place! In order to better study and understand this huge ecosystem, scientists divide it into zones: the Sunlight Zone (at the top), the Twilight Zone (in the middle), and the Deep Ocean (at the bottom).

Today, we'll learn about the Sunlight Zone!

The Sunlight Zone extends down around 200 meters. At midday, it is practically fully lit by the sun, hence called the Sunlight Zone. It is also the warmest layer.

The Sunlight Zone is home to a wide variety of marine species because plants can grow there and water temperatures are relatively warm. Lots of marine animals can be found in the Sunlight Zone, including sharks, tuna, mackerel, jellyfish, sea turtles, seals, sea lions, and stingrays.

Adapted from Nature Works.

[Check it out here for more interesting facts.](#)

Materials: Option 1

- Glass jar
- Water
- Blue food colouring
- Hot glue
- Scissors
- Paper
- Tape
- Markers, optional

Materials: Option 2

- Cardboard box
- Blue paint
- Paintbrush
- Hot glue or glue stick
- Scissors
- Paper
- Tape
- Markers, optional

Directions



"The Sunlight Zone Animals" on page 29

It is time to start an awesome diorama! There are three parts to this diorama; the first one we tackle today, and the remaining over the next two topics.

Option 1: Glass Jar Diorama: Fill your jar with water and add 1 drop of blue food colouring. Secure the lid with hot glue—optional, but recommended to avoid leaks! Use scissors to cut out various plants and animals from construction paper that can be found in the Sunlight Zone. You can also print, colour, and cut out the animals in the Sunlight Zone Animals printable. Secure some plants and animals to the back of your jar so it looks as though they are IN the Sunlight Zone!

Option 2: Cardboard Box Diorama: Alternatively, you can create your diorama by painting the inside of a cardboard box blue and decorating it with plants and animals found in the Sunlight Zone.

Display your Sunlight Zone as you continue the unit study. Feel free to add to it as you learn more throughout the unit study!





TOPIC 4

The Twilight Zone

The Twilight Zone is the water that lies 200 to 1,000 meters below the surface. Very, very little light is able to reach this far down into the water. Let's explore...

Spark Curiosity



Did you know? From ruins to shipwrecks, there are more historical artifacts in the ocean than in all of our museums combined.



If you could be an ocean animal for a day, what would you want to be?

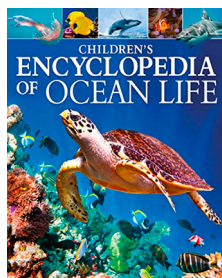
Resource Suggestions



Kingdoms of Marine Life | Marine Biology | The Good and the Beautiful

The Good and the Beautiful
Homeschool Science

All classifications of marine life: animals, plants, protists, fungi, and bacteria can be found below the ocean's surface. How do these groups each live together, but separately? Some are very large and others, microscopic. The ocean is filled with mystery, wonder, and adventure!



Children's Encyclopedia of Ocean Life

Claudia Martin

Full of fascinating facts and stunning sea life photography, this book covers everything from the ocean shores to deep sea creatures.

HANDS-ON ACTIVITY

- "My Ocean Diorama, Part 2" on page 15

Literacy Enrichment Activity

The Twilight Zone is a very dark part of the ocean where there is very little sunlight. Let's make a Twilight Zone scavenger hunt! Write some ocean vocabulary words (appropriate for your child) on some small pieces of paper. If you have different ages and stages, consider using a different colour of paper for each child. If you are stuck on which words to use, have a look through this unit study or a library book! Hide the pieces of paper throughout a room for your child to find.

- ★ Once the words are found, practice saying the name of each letter in the word, or reading the word if developmentally appropriate.
- ☆☆ Once the words are found, practice reading each word and then make up a sentence for each word.
- ☆☆☆ Once the words are found, make up an elaborate, descriptive sentence for each word.



HANDS-ON ACTIVITY

My Ocean Diorama, Part 2

Types of Learning: Scissor Skills, Research, Creativity, Imaginative Play

WHAT'S HAPPENING?

As you learned in the last topic, the ocean is divided into three zones. Today, we'll learn about the Twilight Zone.

The Twilight Zone is a layer of water that lies 200 to 1,000 meters below the ocean surface, just beyond the reach of sunlight, cold and dark. Even still, this zone is teeming with life.

Animals in the Twilight Zone range in size from microscopic zooplankton, to larger crustaceans, fish, and eels, to some of the largest animals on the planet, like the giant squid.

Some organisms spend their lives in its shadowy depths, while others, like the blue whale, travel to and from the surface every day in the largest animal migration on Earth. This helps to support the ocean's food web by transporting huge amounts of carbon from surface waters into the deep ocean.

Adapted from Woods Hole Oceanographic Institution.

[Check it out here for more interesting facts.](#)

Materials: Option 1

- Glass jar
- Water
- Blue food colouring
- Hot glue
- Scissors
- Paper
- Tape
- Markers, optional

Materials: Option 2

- Cardboard box
- Blue paint
- Paintbrush
- Hot glue or glue stick
- Scissors
- Paper
- Tape
- Markers, optional

Directions



"Twilight Zone Animals" on page 30

Today we will continue working on our diorama by building The Twilight Zone!

Option 1: Glass Jar Diorama: Fill a second jar with water and add a few drops of blue food colouring (the water will be darker in the Twilight Zone as barely any sunlight reaches this area), and secure the lid with hot glue. Cut out animals found in the Twilight Zone from construction paper, or use the printable, and add them to the back of your jar.

Option 2: Cardboard Box Diorama: Paint the inside of your second cardboard box a dark blue. Cut out animals found in the Twilight Zone from construction paper, or use the printable, and add them to your diorama.

Display your Twilight Zone next to—or under!—the Sunlight Zone that you created in the last topic. Feel free to add to it as you learn more throughout the unit study!





TOPIC 5

The Deep Ocean

The Deep Ocean starts at around 1,000 meters deep and extends to the deepest points of the ocean. There is no sunlight in the Deep Ocean, the water pressure is extreme, and it is very cold. Despite this, a surprisingly large number of creatures can be found living in the Deep Ocean. Let's explore...

Spark Curiosity



Did you know? Only 5% of the seafloor has been accurately mapped by scientists. In fact, we know more about surface of Mars than we do about our own ocean floor!



I wonder if any people have traveled to the deepest parts of the ocean?

Resource Suggestions



The Deepest Part of the Ocean!

SciShow Kids

Deep in the Pacific Ocean, near China, is the Mariana Trench, the deepest part of the ocean! Join Jessi and Squeaks and learn all about the super-cool, super-tough creatures that make their home there!



Strange Sea Creatures

Erich Hoyt

The book organizes the creatures into three parts based on where they live in the ocean. Informative captions accompany the 90 gorgeous photographs of otherworldly creatures.

HANDS-ON ACTIVITY

- "My Ocean Diorama, Part 3" on page 17

Math Enrichment Word Problem



"2D and 3D Shapes" on page 31

Shapes can be found all throughout the ocean! Use the printable in the back of this unit study to help you as needed. Draw a picture of the ocean that includes fish, coral, sharks, dolphins, and so on in these shapes:



Circle, square, and triangle.



Diamond, trapezoid, and hexagon.



Cone, cylinder, and cube.



HANDS-ON ACTIVITY

My Ocean Diorama, Part 3

Types of Learning: Scissor Skills, Research, Creativity, Imaginative Play

WHAT'S HAPPENING?

The Deep Ocean is divided into three sections:

The Midnight Zone (1,000-40,000 meters deep) starts where the only visible light is produced by creatures themselves. Surprisingly, a large number of creatures can still be found here. Sperm whales can dive down to this level in search of food. Most of the animals that live at these depths are black or red in colour.

The Abyss (4,000-6,000 meters deep) comes from a Greek word meaning “no bottom.” The water is near freezing and few creatures are found here—most are invertebrates such as basket stars and tiny squids.

The Trenches (6,000+ meters deep) are the deepest parts of the ocean. The deepest point is located in the Mariana Trench off the coast of Japan. The water is just above freezing, and the pressure is approximately the weight of 48 jets. There is still life here though! Invertebrates such as starfish and tube worms can thrive at these depths.

Adapted from Sea and Sky.

[Check it out here for more interesting facts.](#)

Materials: Option 1

- Glass jar
- Water
- Blue and/or black food colouring
- Hot glue
- Scissors
- Paper
- Tape
- Markers, optional

Materials: Option 2

- Cardboard box
- Blue and/or black paint
- Paintbrush
- Hot glue or glue stick
- Scissors
- Paper
- Tape
- Markers, optional

Directions



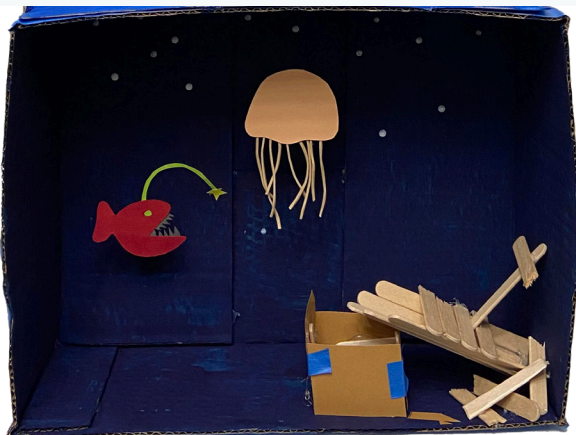
“The Deep Ocean Animals” on page 30

Today we will finish our diorama by building the Deep Ocean!

Option 1: Glass Jar Diorama: Fill a third jar with water and add multiple drops of blue and/or black food colouring (the water will be very dark as no sunlight reaches the Deep Ocean), and secure the lid with hot glue. Cut out animals found in the Deep Ocean from construction paper, or use the printable, and add them to the back of your jar.

Option 2: Cardboard Box Diorama: Paint the inside of your second cardboard box a very dark blue or black. Cut out animals found in the Deep Ocean from construction paper, or use the printable, and add them to your diorama.

Display your Deep Ocean next to—or under!—the Twilight Zone that you created in the last topic. Feel free to add to it as you learn more throughout the unit study!





TOPIC 6

All About Dolphins

Dolphins are a type of marine mammal. There are 40 different species of dolphins, the most famous of which are the bottlenose dolphin and the killer whale—yes, the killer whale, also called an orca, is a member of the dolphin family! Dolphins are some of the most playful and intelligent animals on our planet. Let's explore...

Spark Curiosity



Did you know? Dolphins give themselves names! They develop their own individual whistles, and they recognize their own and other dolphins' names.



I wonder how long a dolphin can stay underwater before coming up for air?

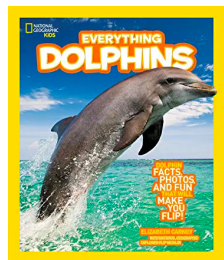
Resource Suggestions



Discovering Dolphins | What Sam Sees

Nat Kids Geo

Check out a super-smart marine mammal on this episode of "What Sam Sees!" Dolphins are acrobats of the sea and are surprisingly similar to humans.



National Geographic Kids Everything Dolphins: Dolphin Facts, Photos, and Fun that Will Make You Flip

Elizabeth Carney

Everything Dolphins explores the world of these extraordinary creatures to help kids learn all about the characteristics that define dolphins, their daily lives, different species, conservation efforts, and much more.

HANDS-ON ACTIVITY

- "Dolphin Suncatcher" on page 19

Literacy Enrichment Activity

Dolphins are such fun and playful animals! There are so many wonderful words that can be used to describe them. Brainstorm a great big list of these descriptive words together.

- ★ Write one descriptive sentence about a dolphin. This can be done by tracing, copying the sentence after your grown-up writes the sentence for you, or phonetic spelling.
- ☆☆ Write two descriptive sentences about two very opposite dolphins. This can be done with copy writing or phonetic spelling. You can check library books to help you spell as well.
- ☆☆☆ Write a very descriptive paragraph about a family pod of dolphins. You can describe the ocean, the time of day, the dolphins, and so on.



HANDS-ON ACTIVITY

Dolphin Suncatcher

Types of Learning: Scissor Skills, Creativity, Fine Motor Skills

WHAT'S HAPPENING?

Today, we'll learn about one of the most famous species of dolphin: the bottlenose dolphin!

Bottlenose dolphins are **marine mammals** that live in warm waters all over the world. Though they live in the water, they breathe through a **blowhole** on the top of their head.

Bottlenose dolphins are thought to be some of the smartest animals on Earth. They communicate through squeaks, whistles, and body language—leaping as high as 20 feet in the air, snapping their jaws, slapping their tails on the surface of the water, blowing bubbles, and even butting heads. Each dolphin has a special whistle that it creates soon after it is born. This whistle is used for identification, just like a human's name.

Bottlenose dolphins are also very social and playful, forming friendships that last decades! A group of dolphins that travel and hunt together is called a **pod**.

Dolphins also produce high frequency clicks, which act as a sonar system called **echolocation**. When the clicking sounds hit an object in the water, like a fish or rock, they bounce off and come back to the dolphin as echoes. Echolocation tells the dolphins the shape, size, speed, distance, and location of the object.

Adapted from National Geographic Kids.

[Check it out here for more interesting facts.](#)

Materials

- Contact paper
- Tape
- Scissors
- Tissue paper

Directions



"Dolphin Silhouettes" on page 32

Let's make a beautiful dolphin suncatcher! Dolphins live in family pods, and today you get to make your very own dolphin pod. You can use different shades of blue to resemble the ocean, or you can use your favourite colours, or make a rainbow!

1. Put a square of contact paper on the table, sticky side up, securing the edges with tape.
2. Cut out the dolphins on the Dolphin Silhouettes printable, then stick the dolphin silhouettes on the contact paper, creating a dolphin pod.
3. Rip or cut squares of tissue paper, then fill the rest of the contact paper with tissue paper.
4. Transfer your dolphin suncatcher to a sunny window to enjoy as you continue the unit study!





TOPIC 7

All About Jellyfish

Jellyfish often look like a rubbery bell with tentacles around the edge or hanging from the bottom. Despite their name, jellyfish aren't actually fish, they're invertebrates (an animal with no backbone). But jellyfish are missing a lot more than a backbone; they don't have a heart, lungs, or brain either! Let's explore...

Spark Curiosity



Did you know? Jellyfish are the oldest multi-organ animal and have roamed the seas for over 600 million years. That's before dinosaurs!



I wonder how a jellyfish can survive without a heart, lungs, or brain?

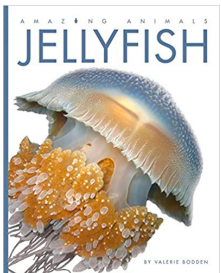
Resource Suggestions



Are Jellyfish the Weirdest Animals In the Ocean?

Be Smart

Jellyfish are mesmerizing and beautiful, and I have no idea how they work. So I went behind the scenes at the Monterey Bay Aquarium with my new friend Tommy to learn all about them.



Amazing Animals: Jellyfish

Valerie Bodden

A basic exploration of the appearance, behavior, and habitat of jellyfish, the bell-shaped, oceanic invertebrates. Also included is a story from folklore explaining why jellyfish have squishy bodies.

HANDS-ON ACTIVITY

- "Jellyfish that Live Forever" on page 21

Math Enrichment Word Problem

Let's do some jellyfish patterning! Continue these patterns using marker dots to represent jellyfish.

- ★ One red jellyfish, two blue jellyfish, three green jellyfish, one red, two blue, three green, one red, two blue, three green.
- ★★ Two red jellyfish, two blue jellyfish, one green jellyfish, one yellow jellyfish, two red, two blue, one green, one yellow.
- ★★★ Two jellyfish, four jellyfish, eight jellyfish.



HANDS-ON ACTIVITY

Jellyfish that Live Forever

Types of Learning: Research, Identification, Labelling

WHAT'S HAPPENING?

Like all jellyfish, a *Turritopsis dohrnii* jellyfish begins when a fertilized **egg** develops into larva, called **planula**.

A planula swims at first, then settles on the sea floor and grows into a cylindrical colony of **polyps**.

The polyps eventually spawn an **ephyra** which grows into a **medusa**—the animals we recognize as jellyfish.

A fully grown *Turritopsis dohrnii* is only about 4.5mm (0.18 inches) across, smaller than a pinky nail! A bright-red stomach is visible in the middle of its transparent bell, and the edges are lined with up to 90 white tentacles.

These tiny, transparent creatures have an extraordinary survival skill, though. In response to physical damage or even starvation, they take a leap back in their development process, transforming back into a polyp.

The process then starts all over, with the polyps spawning medusae identical to the former “adult” jellyfish!

Adapted from American Museum of Natural History.

[Check it out here for more interesting facts.](#)

Materials

- Scissors
- Glue
- Research materials

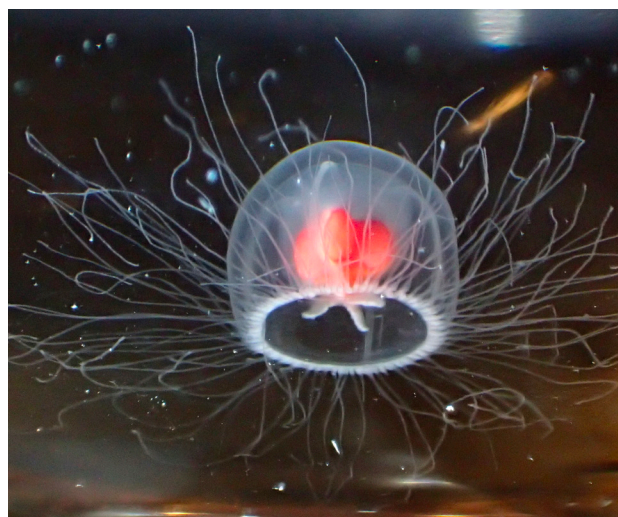
Directions



“*Turritopsis dohrnii* Life Cycle” on page 33

In 1988, scientists discovered something very, very special about a certain jellyfish. The jellyfish, named *Turritopsis dohrnii*, can live forever! This organism can regenerate into a polyp (its earliest stage of life) when it experiences trauma or illness.

1. Print off the *Turritopsis dohrnii* Life Cycle printable.
2. Use the “What’s Happening” section and your library books to help you correctly label each life stage.
3. Cut out the words and paste them into the correct places.





TOPIC 8

Creatures of the Deep

Creatures that live in the deepest depths of the ocean often have some very interesting adaptations. These adaptations, like bioluminescence, help them survive extreme pressure, small amounts of oxygen, little food, no sunlight, and extreme cold. Let's explore...

Spark Curiosity



Did you know? The deepest place in the ocean (and the deepest known point on Earth!) is the Mariana Trench, reaching down 36,000 feet at its deepest point.



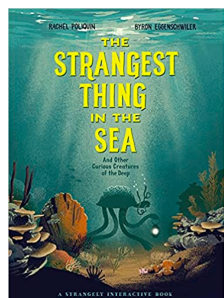
If I discovered a new species living in the ocean, I wonder what it would look like? What would I call it?

Resource Suggestions



Wild Kratts S5 HD - Creatures of the Deep Sea - Wild Kratts Full Episodes TV Show
Wild Kratts HD

In this episode, the Wild Kratts use Aviva's newest transport to dive down into the deep sea for exploration and to potentially discover new life forms.



The Strangest Thing in the Sea: And Other Curious Creatures of the Deep
Rachel Poliquin

An intriguing look at some very strange creatures in the sea—but which is the strangest? A feathery tutu dancing through the water? A tiptoeing rock wearing a wig? A mountain of skulls on the ocean floor? Not everything is quite as it seems in this fascinating exploration of 12 bizarre and little-known sea animals.

HANDS-ON ACTIVITY

- "A Bioluminescent Creature" on page 23

Literacy Enrichment Activity

Make a rhyming poem all about the ocean and things you might find or see while exploring an ocean. Begin by brainstorming some rhyming words together (fish-wish, blue-do, whale-tale, shell-yell, etc.).

- ☆ Make up a short rhyming poem about the ocean. Think of one sentence that ends in one of your word pairs—Maybe: "I went to the ocean and found a blue shell," next think of a second sentence that goes along with the first, but ends in the second word pair—Maybe: "There was a creature inside, so I started to yell!"
- ☆☆ Make up a four-line rhyming poem about the ocean.
- ☆☆☆ Try making up a few different rhyming poems about the ocean written in different ways. You could try to write a funny poem, a descriptive poem, an informative poem, and so on.



HANDS-ON ACTIVITY

A Bioluminescent Creature

Types of Learning: Research, Following Directions, Creativity

WHAT'S HAPPENING?

You may have seen the sparkle of fireflies before on a summer's night. Fireflies produce light through a chemical reaction in their glowing abdomens, a process known as **bioluminescence**.

Did you know that the ocean can also glow and glitter thanks to the light-producing abilities of many marine organisms? Some fish dangle a lighted lure in front of their mouths to attract prey, while some squid shoot out bioluminescent liquid, instead of ink, to confuse their predators. Worms and tiny crustaceans also use bioluminescence to attract mates.

In the deep sea, bioluminescence is extremely common, and because the deep sea is so vast, bioluminescence may be the most common form of communication on the planet!

Adapted from ocean.si.edu.

Check it out here for more interesting facts.

Materials

- Research materials
- Paper
- Paintbrush
- Three highlighters
- Small container
- Water
- Cornstarch
- Food colouring, optional
- Black light

Directions

There are some very unusual and alien-like animals that live in the deepest parts of the ocean. The very deepest part of the ocean is Mariana Trench, found in the Pacific Ocean. Some of the creatures found here are bioluminescent!

1. Look closely at the pictures of these amazing animals in the videos and books you have on hand or by searching online with a grown-up.
2. Create some bioluminescent paint using a highlighter! Remove the felt tip of three non-toxic highlighters and place them in a container. Add some water and allow it to soak. Once the felt tips are white, mix together equal parts of the highlighter water and cornstarch. Stir until the cornstarch completely dissolves.
3. If you want to change the colour of your paint, add a few drops of food colouring and stir.
4. Paint some of the creatures of the deep you have learned about using your homemade glow-in-the-dark paint.
5. Shine a black light on your artwork to see it glow!



TOPIC 9

Coral Reefs

Coral reefs are some of the most diverse ecosystems on the planet, sometimes referred to as the “rainforest of the sea.” Thousands of species of fish, invertebrates, plants, sea turtles, birds, and marine mammals rely on coral reefs for their survival. Let’s explore...

Spark Curiosity

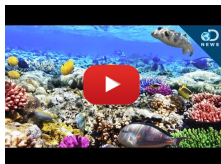


Did you know? 25% of all marine species live on coral reefs!



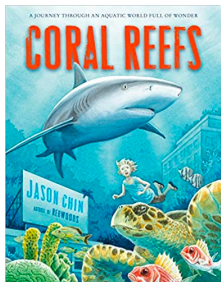
I wonder how we can help protect coral reefs?

Resource Suggestions



What Are Coral Reefs and What's Their Purpose?
Seeker

Coral reefs in the Caribbean are slowly dying! It's estimated that 1/6 of the reefs will be dead in the next 20 years! What is the purpose of these reefs, and can this damage be stopped?



Coral Reefs: A Journey Through an Aquatic World Full of Wonder
Jason Chin

Coral Reefs by Jason Chin plunges readers into the ocean with incredible facts about fish, coral reefs, and marine life. Readers will experience the ocean like they never have before in this stunning picture book full of breathtaking illustrations.

HANDS-ON ACTIVITY

- “Playdough Coral Reef” on page 25

Math Enrichment Word Problem

Coral reefs are beautiful things to see, made up of individual corals, called polyps.

- ★ If there were 10 pieces of coral in one location, and 12 in a second location, how many pieces of coral would there be in total?
- ★★ If there were 5 pieces of coral in 10 different places each, how many pieces of coral would there be in total?
- ★★★ If there were 120 pieces of coral on each reef, and 3 reefs in total, how many pieces of coral would there be in total?



HANDS-ON ACTIVITY

Playdough Coral Reef

Types of Learning: Research, Creativity, Fine Motor Skills

WHAT'S HAPPENING?

Contrary to what many people assume, coral aren't plants—they're animals. A coral reef is composed of thousands of soft-bodied animals called **coral polyps**.

Coral environments attract a multitude of other plants and animals, including a vast variety of brightly coloured tropical fish. Not only are these structures incredibly beautiful, but they are also crucial to the survival of life on Earth.

Coral reefs can be divided into three types: **fringing reefs, barrier reefs, and atolls**.

Fringing reefs are close to shore, whereas a barrier reef will lie further out to sea. Often, atolls will be mistaken for islands because they are so large and generally appear on the rim of a lagoon.

Coral needs sunlight to grow, which is why they thrive in shallow water. As a result, you're unlikely to find a coral reef deeper than 45 feet.

Large, visible reefs like the Great Barrier Reef in Australia are between 5,000 and 10,000 years old. Over time, the Great Barrier Reef has grown to include 900 smaller reefs and cover 2,600 miles crossing 500 islands.

Adapted from blogpatagonia.australis.com.

[Check it out here for more interesting facts.](#)

Materials

- Simple kitchen tools
- Research materials, for shaping playdough optional
- Playdough

Directions



"Coral Playdough Mats" on page 34-35

There are many different types of coral, each one beautiful and unique. Today, you'll use playdough to make your own beautiful coral reef.

1. Begin by whipping up a batch of playdough (my easy, no-cook recipe is below).
2. Print off the Coral Playdough Mats and make little pieces. You can also use library books as a reference to create different types of coral.
3. Place each little piece of coral onto your larger coral reef playdough mat. You can make some little fish to swim around too, if you'd like!

Playdough Recipe

This is the best playdough recipe, as even very little ones can help in almost the whole recipe. PLUS, you can't mess it up! If it is too sticky—add more flour; too clumpy—add more boiled water.

1. Mix **1 ½ cups flour**, **½ cup salt**, and **2 tsp cream of tartar** in a bowl. The order of ingredients doesn't matter—just pop it all in and stir!
2. Add in **1 cup boiling water**, **2 tbsp oil** and stir. You can add **food colouring** directly to the boiling water if you prefer for nice, easy colour mixing. Or if you want different colours, you can add the food colouring at the end into divided batches.
3. Knead a few times, and it will become perfectly smooth. You can mix in some **essential oils** if you have any, or **vanilla**, or **cinnamon**.



TOPIC 10

Marine Biologists

Marine biologists study ocean creatures, including animals, plants, and even bacteria. They also investigate all kinds of issues and problems, including overfishing, plastic pollution in the oceans, the effects of oil spills, and the use of pesticides. Let's explore...

Spark Curiosity

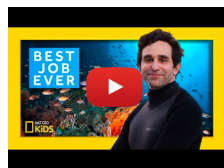


Did you know? The majority of life on Earth is aquatic. 94% of Earth's living species exist in the oceans!



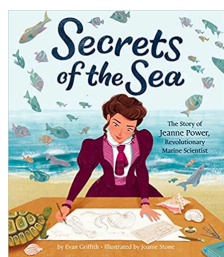
I wonder if humans will ever build homes in the ocean?

Resource Suggestions



Marine Biologist: David Gruber | Best Job Ever
Nat Geo Kids

David Gruber studies glow-in-the-dark fish! Learn more about being a marine biologist in this episode of Best Job Ever.



Secrets of the Sea: The Story of Jeanne Power, Revolutionary Marine Scientist
Evan Griffith

The curiosity, drive, and perseverance of the nineteenth-century woman scientist who pioneered the use of aquariums to study ocean life are celebrated in this gorgeous, empowering picture book.

HANDS-ON ACTIVITY

- "A Mystery to Solve" on page 27

Literacy Enrichment Activity

Look through a picture book about the ocean, fish, dolphins, or anything of interest to you.

- ☆ Retell that book to a grown-up by stating what happened at the beginning, middle, and end.
- ☆☆ Summarize that book by writing down the most important parts.
- ☆☆☆ Summarize that book by writing down the most important parts. How did you decide what to include?



HANDS-ON ACTIVITY

A Mystery to Solve

Types of Learning: Research, Problem Solving

WHAT'S HAPPENING?

Our oceans are absolutely teeming with life! It's a marine biologist's job to study these ocean creatures, including animals, plants, and even bacteria.

But what is it about these creatures that marine biologists study? Well, the possibilities are as numerous as the number of animals in the ocean! Many scientists study why animals behave in a certain way. For example, they may research why whales live in pods, or why some fish return to the same breeding ground year after year. They may also study food sources, plant and animal life cycles, and even entire ecosystems! Ultimately, understanding how ocean **flora** and **fauna** (that's plants and animals) interact with each other is an integral part of marine biology.

Marine biologists can study ocean life in many different ways. They may don a wet suit and scuba gear and get up close and personal with the creatures they're studying. But for those scientists who study the darkest depths of the oceans, biologists can use diving submarines that are equipped with robotic arms and bright lights!

One of the most important roles of marine biologists is wildlife and environmental protection. By researching how human actions can affect ocean ecosystems, we can better understand how to protect them.

Adapted from Spring into STEM.

[Check it out here for more interesting facts.](#)

Materials

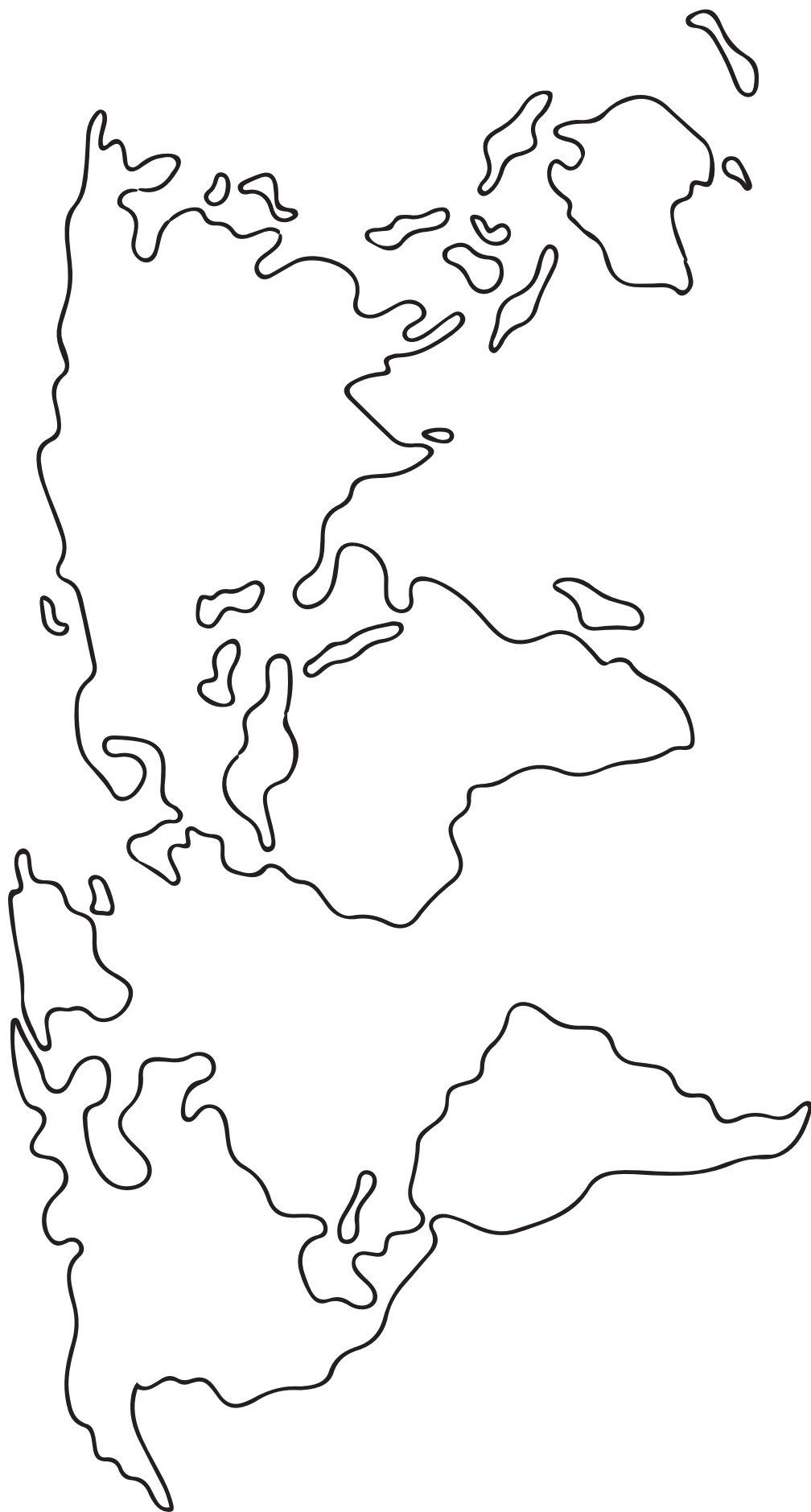
- Computer or research materials

Directions

Marine biologists are specialized scientists who focus on our oceans and the creatures who live there. There are many different roles that a marine biologist might have! Sometimes they even need to solve mysteries.

1. Pretend you are a marine biologist. You have been studying and monitoring a coral reef for several years and have noticed that it has started to turn white!
2. Do some research on the computer with your grown-up to try to find out why this might be happening.
3. Is there anything you can do about it?

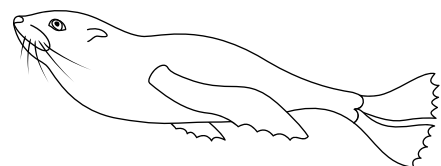
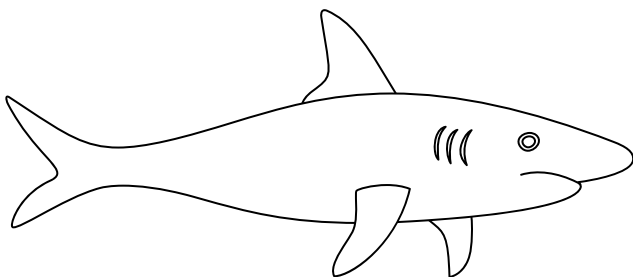
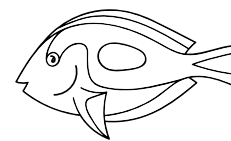
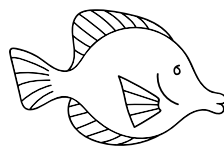
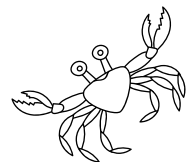
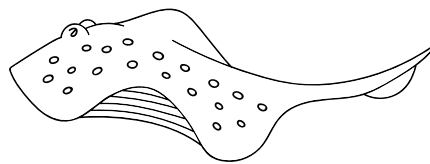
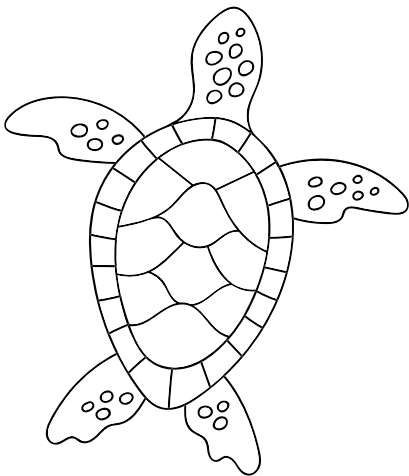
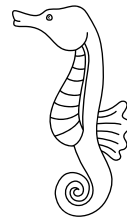
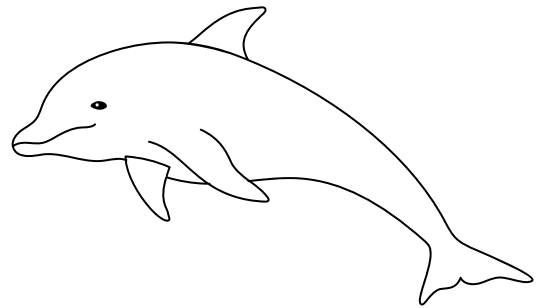
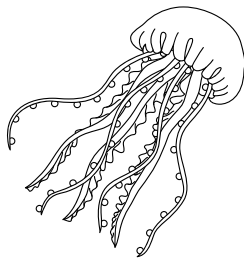
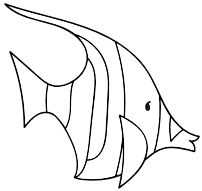






TOPIC: THE SUNLIGHT ZONE

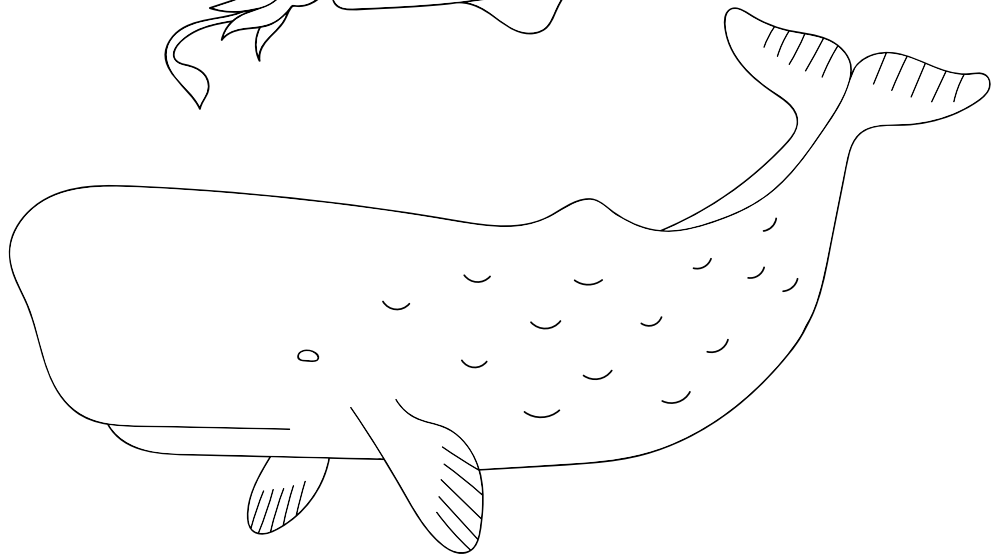
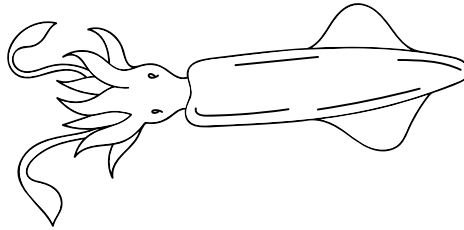
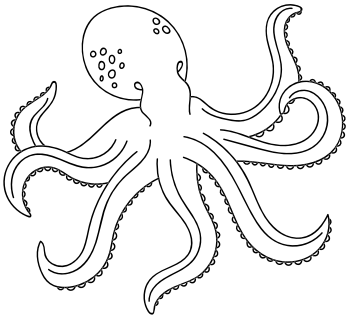
Sunlight Zone Animals





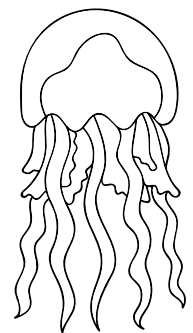
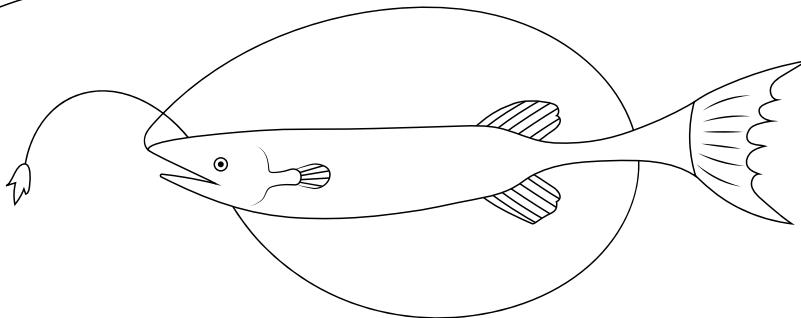
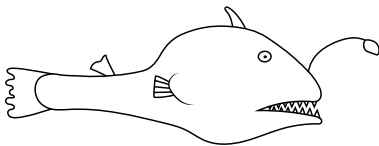
TOPIC: THE TWILIGHT ZONE

Twilight Zone Animals



TOPIC: THE DEEP OCEAN

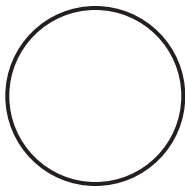
Deep Ocean Animals



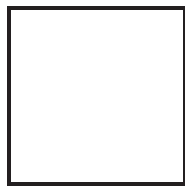


TOPIC: THE DEEP OCEAN

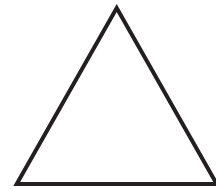
2D and 3D Shapes



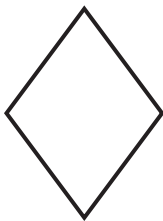
Circle



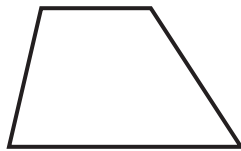
Square



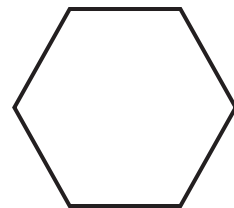
Triangle



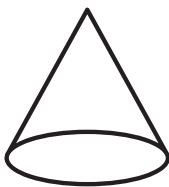
Rhombus



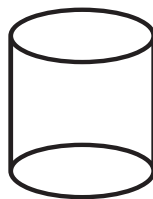
Trapezoid



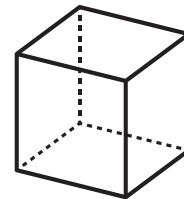
Hexagon



Cone



Cylinder

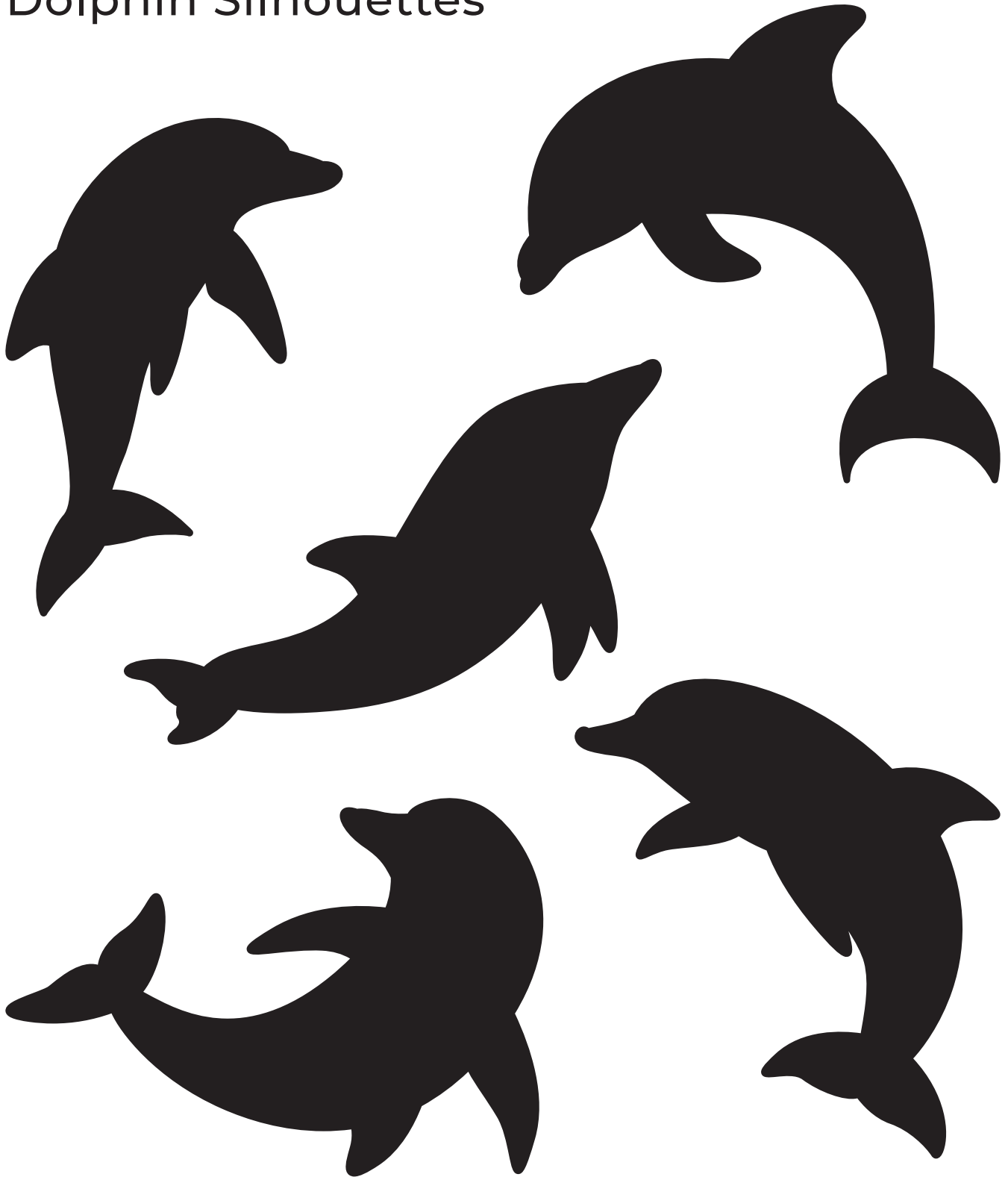


Cube



TOPIC: ALL ABOUT DOLPHINS

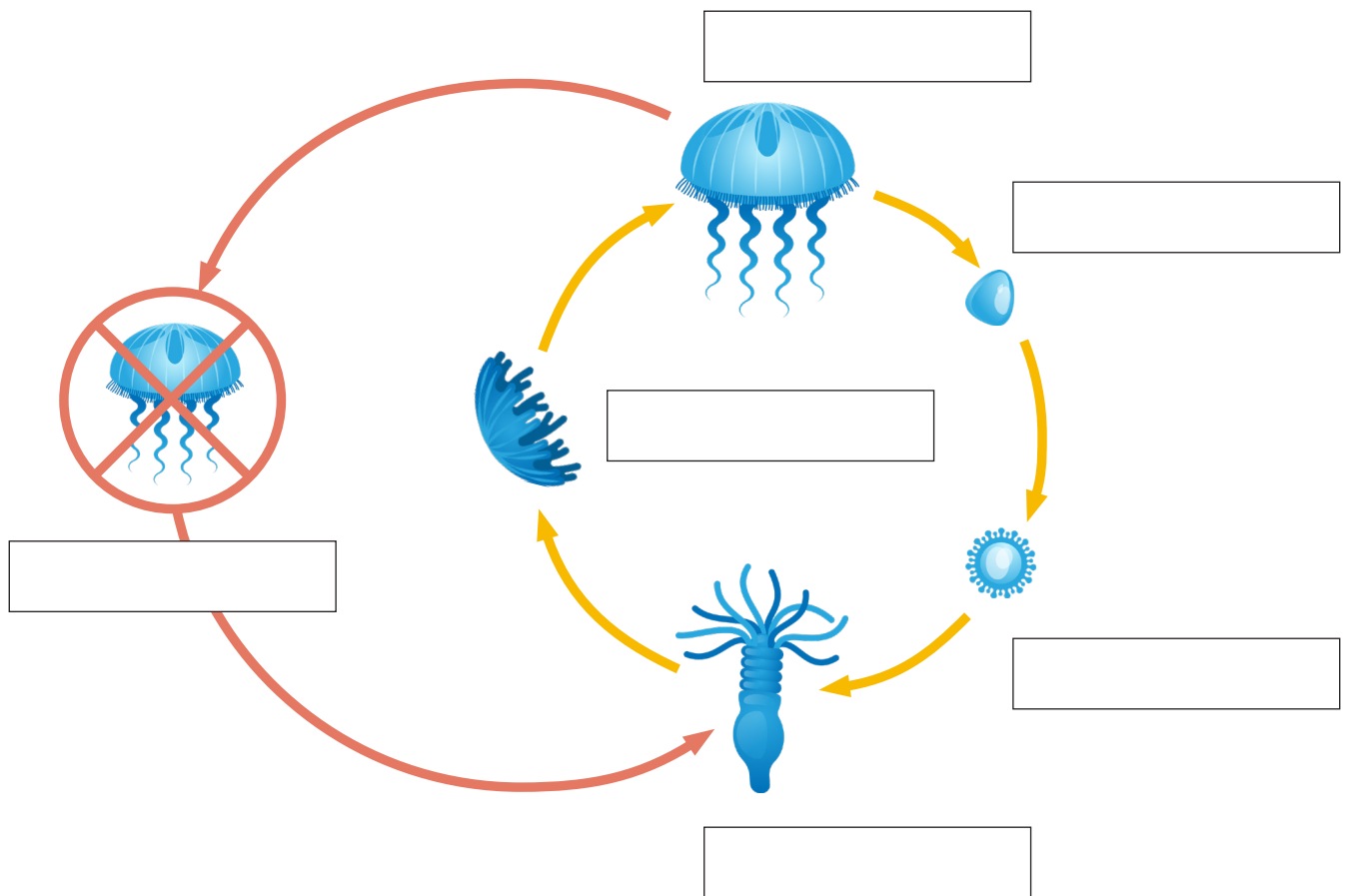
Dolphin Silhouettes





TOPIC: ALL ABOUT JELLYFISH

Turritopsis dohrnii Life Cycle



Egg

Medusa

Polyp

Ephyra

Planula Larva

Dying Medusa

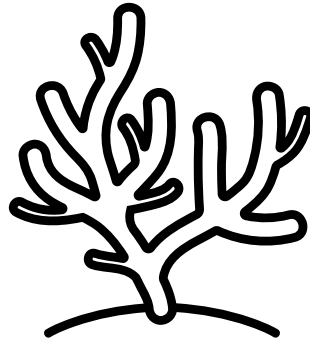


TOPIC: CORAL REEFS

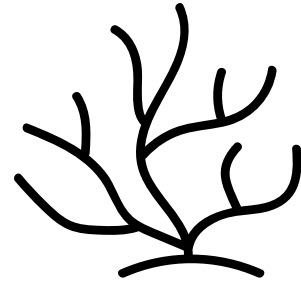
Coral Playdough Mats



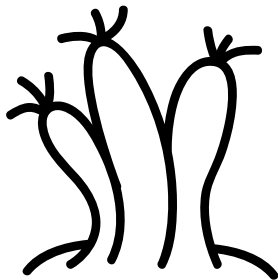
Tube Coral



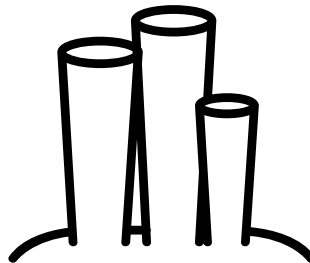
Staghorn Coral



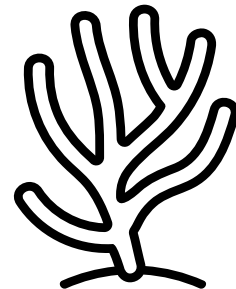
Sea Whip Coral



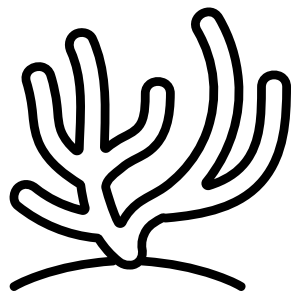
Sea Anemone



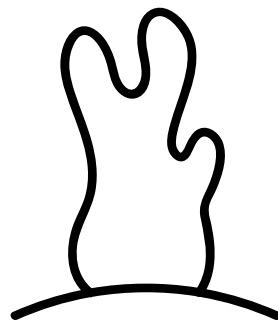
Stove Pipe Sponge



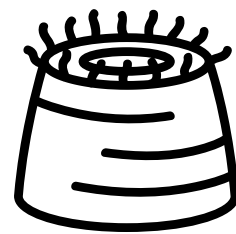
Precious Coral



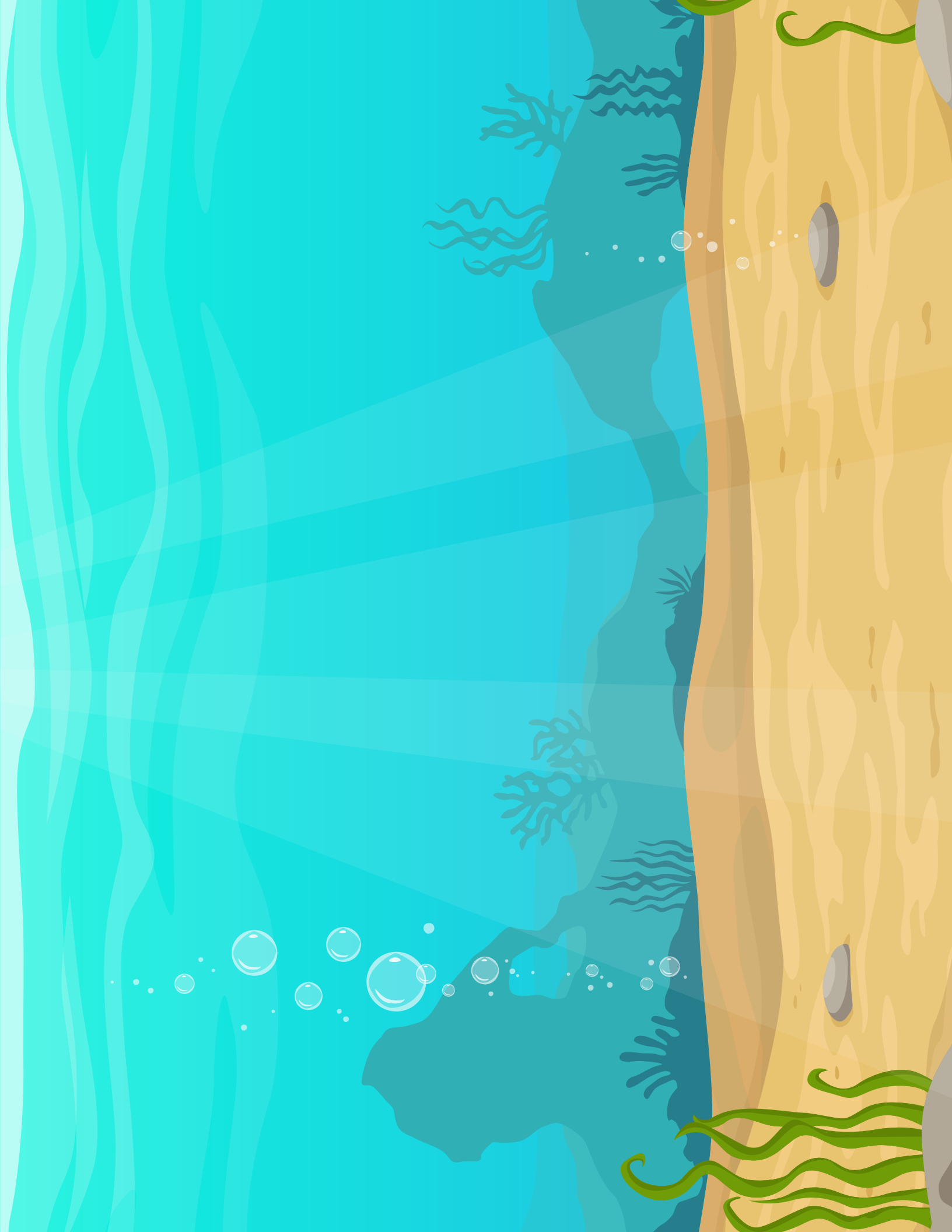
Finger Coral



Lettuce Coral



Sea Anemone





My Unit Study Notes on the Ocean

TOPIC 1: THE FIVE OCEANS

A large, empty rectangular box with a thin black border, intended for handwritten notes.Ten horizontal lines for handwritten notes, aligned to the right of the large box.

TOPIC 2: WAVES

A large, empty rectangular box with a thin black border, intended for handwritten notes.Ten horizontal lines for handwritten notes, aligned to the right of the large box.



My Unit Study Notes on the Ocean

TOPIC 3: THE SUNLIGHT ZONE

A large, empty rectangular box with a thin black border, intended for a drawing or illustration related to the Sunlight Zone.

TOPIC 4: THE TWILIGHT ZONE

A large, empty rectangular box with a thin black border, intended for a drawing or illustration related to the Twilight Zone.



My Unit Study Notes on the Ocean

TOPIC 5: THE DEEP OCEAN

A large, empty rectangular box with a thin black border, intended for handwritten notes related to Topic 5.Ten horizontal lines for handwritten notes, aligned to the right of the large rectangular box.

TOPIC 6: ALL ABOUT DOLPHINS

A large, empty rectangular box with a thin black border, intended for handwritten notes related to Topic 6.Ten horizontal lines for handwritten notes, aligned to the right of the large rectangular box.



My Unit Study Notes on the Ocean

TOPIC 7: ALL ABOUT JELLYFISH

A large, empty rectangular box with a thin black border, intended for a drawing or illustration related to the topic of jellyfish.

TOPIC 8: CREATURES OF THE DEEP

A large, empty rectangular box with a thin black border, intended for a drawing or illustration related to the topic of creatures of the deep.



My Unit Study Notes on The Ocean

TOPIC 9: CORAL REEFS

A large, empty rectangular box with a thin black border, intended for a drawing or illustration related to the topic of coral reefs.

TOPIC 10: MARINE BIOLOGISTS

A large, empty rectangular box with a thin black border, intended for a drawing or illustration related to the topic of marine biologists.
